—RETRO—
HARDWARE

Plus 1 Support ROM
USER GUIDE

A New Updated Support ROM for the Acorn Electron Plus 1

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1 SROM Commands

*INSERT (<rom>) (I)

*PINSERT (<rom>) (I)
Inserts a **ROM**, counteracting a previous ***UNPLUG**. The **ROM** will not become active until the next **Break**. If no **<rom>** is given the user is prompted through a list of **ROM**s and asked to confirm which **ROM**s to insert.

If the '**I**' option is given and the **ROM** has a valid **ROM** header, then it is inserted into the **ROM** table and will respond to service calls.

Note: Some **ROM**s such as filing systems also need **Break** pressing to initialise them.

Option: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Option: **I** : inserts the **ROM** into the **ROM table** removing the requirement for Break.

Examples:

***INSERT**	<- Presents the user with a list of **ROMs**
***INSERT F**	<- Inserts **ROM F (15)** – Requires a Break
***INSERT 3**	<- Inserts **ROM 3** – Requires a Break
***INSERT 15 I**	<- Inserts **ROM 15 (F)** – No Break required

*LANG (<rom>)

*PLANG (<rom>)
This specifies the default **language** to enter on **Ctrl-Brk**. When **Ctrl-Brk** is pressed if the default **language** is ***UNPLUG**ged, or **<rom>** was not specified, the highest priority **language** is selected by checking all the **ROM**s. The **ROM**s in sockets numbered below the **AP6 ROM** are checked first, then the **ROM**s in sockets numbered above the **AP6 ROM**. If there are no available **languages** or the **AP6 ROM** is the default **ROM** a **'No Language Environment'** * prompt is given where you can enter ***commands**.

Option: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Examples:

***LANG**

Will set the Language to the highest **ROM** position that holds a Language for the next Ctrl-Brk.

***LANG F**

Sets **ROM F (15)** as the current language **ROM** for the next Ctrl-Brk.

*LROMS

*PLROMS

This locks all ROMs in the same way as ***SRLOCK** with no **<rom>** specified, then does ***ROMS** (see ***ROMS** for details).

Note:

The New **AP6** supports locking for the cartridge sockets **0, 1, 2, 3** (with compatible cartridges) and **ROM** sockets **5, 6, 13 (D)** and **15 (F).**

*ROMS

*PROMS

Lists all active **ROMs**, unplugged **ROMs** and banks of sideways **RAM** or **EEPROM**. Each line is in the following format:

```
ROM  n * (SLR) ROM TITLE VERSION
     : :  : : :
     n :  : : :  ..... is the ROM number in hex
       *  : : :  ..... indicates the default language
          U : :  ..... indicates the bank is unplugged
          S : :  ..... indicates the ROM has a service entry
            L :  ..... indicates the ROM has a language entry
              E  ..... indicates the bank is EEPROM, if unlocked.
              R  ..... indicates the bank is RAM, if unlocked.
```

If the bank contains a valid ROM, the **ROM**'s title and version string is displayed.

*SRLOAD <file> <rom> (U) (L) (I)

Aliases: *RLOAD, *ROMLOAD *PRLOAD, *PROMLOAD

*PSRLOAD <file> <rom> (U) (L) (I)

Loads the specified **<file>** into sideways bank **<rom>**. If the **U** option is given the bank is **UNLOCK**ed before loading. If the **L** option is given the bank is **LOCK**ed after loading. If the **I** option is given and the **ROM** has a valid **ROM** header, then it is inserted into the **ROM table** and will respond to service calls.

Note Some **ROM**s such as filing systems also need **Break** pressing to initialise them.

Required: **<file>** : A valid file name. This can comprise the full path, if needed.

Required: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Option: **U** : Unlocks the bank before loading, if the bank supports unlocking.

Option: **L** : locks the bank after loading, if the bank supports locking.

Option: **I** : Inserts the **ROM** into the **ROM table** removing the requirement for Break.

Examples:

***SRLOAD VIEW 13 L I**

Loads **View**, from the currently selected drive and filing system, into **ROM** bank number **13 (D)**, **LOCK**ing, after loading, and then inserting its presence into the **ROM Table.** Assumes the position is **UNLOCK**ed already.

***SRLOAD :1.VIEW 5 U L I**

Loads **View**, from drive number **1**, into **ROM** bank number **5. UNLOCK**ing before loading, **LOCK**ing, after loading.

***SRLOAD TEST E**

Loads a file called **TEST**, from the currently selected drive and filing system, into **RAM** bank number **E (14).**

Notes:

(1) The **New AP6** supports locking for the cartridge sockets **0, 1, 2, 3** (with compatible cartridges) and **ROM** sockets **5, 6, 13 (D)** and **15 (F)**.

(2) *SRLOAD will load to sideways **RAM** or **EEPROM** if it is unlocked. If the bank is **ROM**, or is **LOCK**ed, a 'Bank not writable' error is generated.

(3) ***SRLOAD** uses main memory at **&2000-&5FFF** to load the file, and will change to **MODE 6** (or **MODE 7** if present), if not in **MODE 6** or **7,** to free enough memory. If you have a program or data in memory that you want to keep, save it before you use this command.

(4) ***SRLOAD** verifies during the loading procedure.

*SRLOCK (<rom>)

Aliases: *LOCK *PLOCK

*PSRLOCK (<rom>)

This locks a bank of sideways **RAM**, making it write protected. If no **<rom>** is given then all lockable banks are locked.

Note: Banks of sideways **RAM** are paired: **0/2 1/3 5/6 13/15 (D/F)**, so **LOCK**ing one of a pair will also **LOCK** the other.

Option: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Note:

The New **AP6** supports locking for the cartridge sockets **0, 1, 2, 3** (with a compatible cartridge) and **ROM** sockets **5, 6, 13 (D)** and **15 (F)**.

Examples:

***LOCK**

Locks ALL lockable **ROM** banks, including any compatible Cartridges.

***LOCK F**

Locks **ROM F (15)** and **ROM D (13)** as these two banks have a common locking mechanism.

*SRSAVE <file> <rom>

Aliases: *RSAVE, *ROMSAVE *PRSAVE, *PROMSAVE

*PSRSAVE <file> <rom>

Save the specified sideways bank **<rom>** as **<file>**.

Required: **<file>** : A valid file name. This can comprise the full path, if needed.

Required: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Examples:

***SRSAVE VIEW 4**

Saves **View**, to the currently selected drive and filing system, from **ROM** bank number **4**.

***SRSAVE :1.TEST 4**

Saves **Test** from **ROM** bank number **4** to drive number **1**.

Notes:

(1) No check is made to test if the **<rom>** has any valid contents. If the **<rom>** is a language the saved file's load and execution addresses will be set to the **ROM**'s language entry address.

(2) The file is copied to main memory at &2000-&5FFF to save the file, and will change to **MODE 6** (or **MODE 7** if present), if not in **MODE 6** or **7,** to free enough memory. If you have a program or data in memory that you want to keep, save it before you use this command.

*SRWIPE <rom> (U) (L)

Aliases: *ZERO *PZERO

*SRWIPE <rom> (U) (L)

Wipes the **<rom>** bank and removes it from the **ROM table**. No check is made to see if the **<rom>** contains **RAM** or if it is **UNLOCK**ed. If the bank is locked or contains ROM the only effect will be to remove the **<rom>** from the **ROM table**.

Required: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Option: **U** : Unlocks the bank before wiping, if the bank supports locking.

Option: **L** : locks the bank after wiping, if the position supports locking.

*SRUNLOCK (<rom>)

Aliases: *UNLOCK *PUNLOCK

*PSRUNLOCK (<rom>)

This unlocks a **<rom>** bank, allowing writes to it. If no **<rom>** is given then all banks are unlocked.

Option: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0 to 15** or **0 to F**.

Notes:

(1) The New **AP6** supports locking for the cartridge sockets **0, 1, 2, 3** (with compatible cartridges) and **ROM** sockets **5, 6, 13** and **15.**

(2) Banks of sideways **<rom>** are paired: **0/2 1/3 5/6 13/15**, so **UNLOCK**ing one of a pair will also **UNLOCK** the other.

(3) Specifying **<rom>** numbers that don't support **LOCK**ing/**UNLOCK**ing will have no effect.

*UNPLUG (<rom>) (U)

*PUNPLUG (<rom>) (U)

Unplugs a **<rom>**, making it invisible to the system until it is ***INSERT**ed. The **<rom>** remains active until the next Break. If no **<rom>** is given the user is prompted through each **<rom>** position and asked to confirm which to **UNPLUG**.

Required: **<rom>** : Can be a decimal or hexadecimal **ROM** number from **0** to **15** or **0** to **F**.

Option: **U** : If the **U** option is given the **ROM** is immediately removed from the **ROM table** and will stop responding to service calls.

Notes:
(1) If you ***UNPLUG** the **AP6 OS ROM** it stops responding after the next Break, *as do all other ***UNPLUG**ged **ROM**s*. This can be useful to put the Electron in a "stripped-down" state by ***UNPLUG**ging everything except **BASIC**.
(2) Once the **AP6 ROM** has been ***UNPLUG**ged the only way to ***INSERT** it, or any other **<rom>**, is to turn the power off and back on again or do a **memory-clear Reset** by doing ***FX200,2** or ***FX200,3** and pressing Break.

*UROMS

*PUROMS

This unlocks all **<rom>** positions in the same way as ***SRUNLOCK** with no **<rom>**, then does ***ROMS** (see ***ROMS** for details).

Notes:

(1) The New **AP6** supports locking for the cartridge sockets **0, 1, 2, 3** (with compatible cartridges) and **ROM** sockets **5, 6, 13** and **15.**
(2) **Beware!** Unlocking sockets containing 28C256 EEPROMs, loaded with a valid **ROM** image, could cause a system malfunction!

2 Utils Commands

*BUILD <file>

*PBUILD <file>

***BUILD** creates a file with the specified name and each line of keyboard input is written to the file, suitable for using with ***EXEC**. The input is terminated by pressing Escape which then closes the file

Required: **<file>** : A valid file name, this can comprise the full path, if needed.

Examples:

***BUILD EXEC**

Builds the file **Exec**, to the currently selected drive and filing system.

***BUILD :1.TEST**

Builds the file **Test** to drive number **1**.

*DUMP <file>

*PDUMP <file>
***DUMP** displays a hexadecimal and ASCII dump of the named file, with each line preceded by the offset into the file of each line. The width of the dumpout adjusts to fit the width of the text window.

Required: **<file>** : A valid file name, this can comprise the full path, if needed.

Examples:

***DUMP TEST**

Dumps the file **Test**, to the display.

***DUMP :1.TEST**

Dumps the file **Test**, from drive number **1**, to the display.

*FORMAT <drive> <S|M|L> (Y)

*PFORMAT <drive> (S|M|L) (Y)

Formats the disk in the specified floppy drive as an **ADFS** disk.

Required: **<drive>** : The drive number can be **0/1**, **4/5** or **A/B**, but always selects one of the two floppy drives even if a hard drive is attached.

Required: **<S|M|L>** : The size specifies:

S(mall) for 40-track single-sided.

M(edium) for 80-track single-sided.

L(arge) for 80-track double-sided.

Option: **Y** : If the **Y** option is given the ***FORMAT** command goes ahead without any prompting to start the format or to overwrite an existing disk.

If the **Y** option is not given, the user is prompted to continue before formatting. If the disk is already formatted, the user is prompted again before overwriting it.

Notes:

(1) While the formatting is progressing the drive and track number is displayed.

(2) ***FORMAT** uses main memory to create the track layout. To try and avoid overwriting any program or data in main memory it uses **&1800** bytes below screen memory (e.g. **&4800** upwards in **MODE 6**), and will change to **MODE 6** (or **MODE 7** if present) if in **MODE 0-3**, to free enough memory.

(3) If using **Acorn ADFS 1.00** a dummy file **ZXSysHelp** is saved to protect against a bug in **ADFS**.

(4) If **ADFS** is not the current filing system, the command is passed on to any other **ROM**s or filing systems, and you will get a 'Bad command' error if nothing else responds.

*LIST <file>

*PLIST <file>

***LIST** displays the contents of the file directly to the **VDU** with each line preceded with a line number. **CR, LF, CRLF** and **LFCR** end-of-line sequences are all displayed as a single newline.

Required: **<file>** : A valid file name. This can comprise the full path, if needed.

Examples:

***LIST TEST**

Lists the file **Test**, to the display.

***LIST :1.TEST**

Lists the file **Test**, from drive number **1**, to the display.

*TYPE <file>

*PTYPE <file>

***TYPE** displays the contents of the file directly to the **VDU**. **CR, LF, CRLF** and **LFCR** end-of-line sequences are all displayed as a single newline.

Required: **<file>** : A valid file name, this can comprise the full path, if needed.

Examples:

***TYPE TEST**

Lists the file **Test**, to the display.

***TYPE :1.TEST**

Lists the file **Test**, from drive number **1**, to the display.

*VERIFY <drive>

*PVERIFY <drive>

Verifies the disk in the specified floppy drive as an **ADFS** disk by reading all the data on every track.

Required: **<drive>** : The drive number can be **0/1**, **4/5** or **A/B**, but always selects one of the two floppy drives even if a hard drive is attached.

Notes:

(1) While the ***VERIFY** command is progressing the drive and track number are displayed. If an error occurs it is displayed with a new line so you will have a list of all tracks with an error on them.

(2) ***VERIFY** uses main memory to read the data. To try to avoid overwriting any program or data in main memory it uses **&1400** bytes below screen memory (e.g. **&4C00** upwards in **MODE 6**) and will change to **MODE 6** (or **MODE 7** if present) if in **MODE 0-3**, to free enough memory.

(3) If **ADFS** is not the current filing system, the command is passed on to any other **ROM**s or filing systems, and you will get a **'Bad command'** error if nothing else responds.

Examples:

***VERIFY 0**

Verifies **ADFS** drive **0**.

3 Miscellaneous Commands

*AQRPAGE <page>

*PAQRPAGE <page>

Selects the specified page in any bank of **Advanced Quarter-Meg RAM** and rebuilds the **ROM** table.

Required: **<page>** : Can be a decimal or hexadecimal number from **0** to **15** or **0** to **F**.

4 Errors Codes

Error 17: Escape

When a command is terminated by pressing **Escape**, an **'Escape'** error is given.

Error 135: Bank not writable

This error is given if ***SRLOAD** or ***SRWIPE** is used specifying a sideways ROM or a locked bank of **RAM** or **EEPROM**.

Error 146: Aborted

If (**Y**)es is not given when ***FORMAT** prompts the user to continue or to overwrite an existing disk, an '**Aborted**' error is given.

Error 148: Bad size

***FORMAT** can only specify a drive size as **L**(arge) **M**(edium) or **S**(mall).

Error 201: Disk read only

This error is given if you try to ***FORMAT** a write-protected disk.

Error 204: Bad filename

If no **<file>** is given to ***SRLOAD** or ***SRSAVE** a **'Bad filename'** error is given.

Error 205: Bad drive

***FORMAT** and ***VERIFY** only allow the use of drive **0, 1, 4, 5, A, B, E, F** to specify **floppy drive 0** or **floppy drive 1**.

Error 214: File not found

If a command to load or read a file specifies a non-existent file a **'File not found'** error is given. Filing system commands may also give other filing-system dependent errors.

Error 249: Not a language / Language?

If you specify a non-language ROM with ***LANG** a **'Not a language'** error will be given. On **Ctrl-Break** if there are no languages that can be entered a **'Language?'** error will be given.

Error 252: Bad number

<rom> can be a decimal or hexadecimal **<rom>** number from **0** to **15** or **0** to **F**. If a number outside this range is specified the error **'Bad number'** is given.

Error 254: Bad command

If ***FORMAT** or ***VERIFY** is used when **ADFS** is not the current filing system, the command is passed on to other **ROM**s and the filing system. If nothing else responds with a ***FORMAT** or ***VERIFY** command a **'Bad command'** error will be given.

5 Compatibility

The **ROM** manager recognises the standard **SROM** commands. To allow programs to be compatible with other **ROM** managers the following aliases are recognised:

***RLOAD *ROMLOAD**	-> ***SRLOAD**
***RSAVE *ROMSAVE**	-> ***SRSAVE**
***ZERO**	-> ***SRWIPE**
***LOCK**	-> ***SRLOCK**
***UNLOCK**	-> ***SRUNLOCK**

For compatibility with Acorn **SRAM** commands ***SRLOAD** and ***SRSAVE** can take **<start> <end>** and **+<length>** parameters, which are just ignored and always default to **<start>=8000** and **<length>=4000** or **<end>=C000**. So, for example, the Acorn syntax: ***SRLOAD file 8000 6** is accepted with the **8000** being ignored.

***SRLOAD** and ***SRSAVE** also allow the **(Q)**uick option which specifies loading/saving via main memory. This is ignored as ***SRLOAD** and ***SRSAVE** always use main memory.

Both ***HELP SROM** and ***HELP SRAM** will list the **SROM** commands.

All commands can be prefixed by a **'P'** character to prevent clashes with other **ROMs**. For instance, if a higher priority **ROM** has a ***ROMS** command, ***PROMS** will call the **AP6 *ROMS** command.

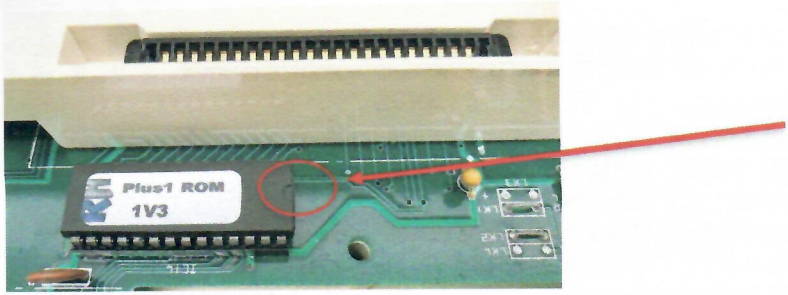
6 Technical Information

Memory usage:
&0D68-&0D6B: Plus 1.
&0D6C-&0D6F: **ROM** Manager
&0D70-&0D7D: **ROMFS/CFS** vectors.
&0AC0-&0AFF: Used to create **ZYSysHelp** file.
&2000-&5FFF: ***SRLOAD/*SRSAVE** file buffer.
&1A00 bytes below screen memory: ***FORMAT** workspace.
&1400 bytes below screen memory: ***VERIFY** workspace.

10 - Fitting The Plus 1 Support ROM

First, you'll need to remove the Plus 1 from the Electron, by removing the two large screws from the underside. Then remove the top cover, of the Plus 1, by removing the three screws.

Use the photo below to identify the ROM to replace. Use a flat bladed screwdriver and gently prise-up the ROM, at both ends, a little at a time. Fit the new ROM in its place by gently inserting it into the socket, ensuring all the pins are aligned, and then pressing down gently.



Note the position of the Notch!

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